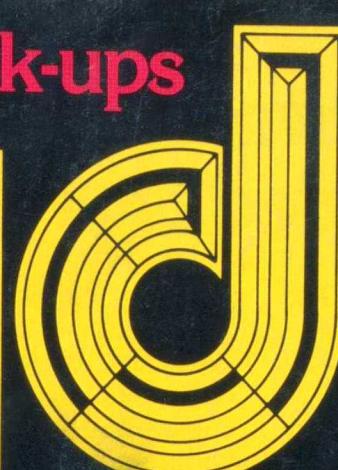


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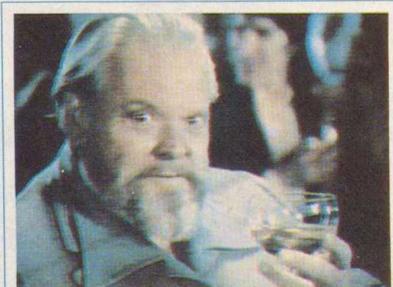
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ABOUT THE COVER

Advent's newest model projection TV, VideoBeam 100, has a dual personality. When closed, it looks and functions like a coffee table. Lifting the table's top, though, transforms the piece of furniture into a console projection TV. Now you can watch TV and eat on it, too. Photography by Sametz Blackstone Associates.



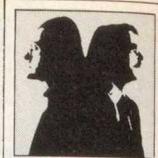
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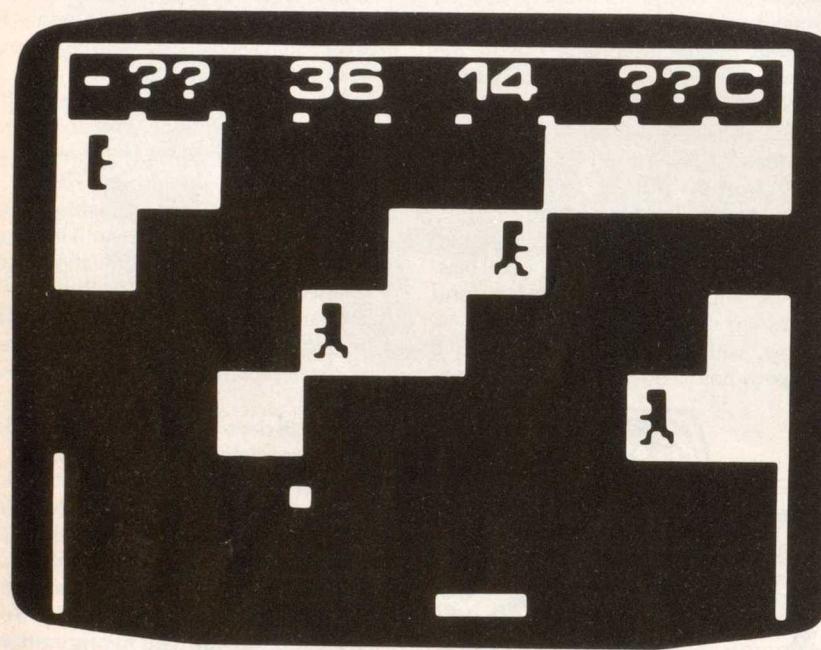
Arcade Alley

A Critical Look at Video Cartridge Games & Programs



by Bill Kunkel & Frank Laney, Jr.

'I Want to be Alone' Solo Video Games



With Magnavox's **Blockout**, players must chop through a demon-inhabited target wall.

Quite a few of the gamers we've encountered during our monthly strolls down "Arcade Alley" suffer the same chronic frustration: finding enough opponents to slake their thirst for endless hours of play.

It can really be a problem. As many readers will testify, it isn't always easy to find someone brave enough to accept the challenge and pick up that other controller.

And it's even harder to locate someone of approximately equal ability to ensure an enjoyably even match. An aracker with average videogaming skills often bores the good players while frightening off the bad ones.

Solitaire cartridges offer an obvious solution to this dilemma. It's simple enough, when human foes are scarce, to plug in a solo program and battle it out with the machine. Of course, a good player will regularly defeat one of the lightly powered

programmable home arcade systems, but at least the unit never sulks or buries you under a pile of alibis after each drubbing.

There is a catch. Some of the most popular videogames — the sports simulations immediately spring to mind — are generally not available in one-player versions.

Atari took into account the need for play-alone games when it first marketed its programmable system a couple of years ago. It included one-player options in as many of its early releases as possible. Thus lonely Atari owners could while away the hours with such exciting programs as "Surround," "Air-Sea Battle," and "Breakout." Other companies proved a hair slower on the uptake, but Magnavox in particular is now doing an outstanding job of catering to the solo aracker.

In fact, the Magnavox *Odyssey²* has brought new flexibility to solo play in the last year or so. When one of the company's newer cartridges is activated, both sides'

competitors appear on the screen and wait for further instructions. If the lefthand player engages his joystick while nothing happens on the right, the system automatically assumes control of that side — or vice versa. If no human player enters the fray, the *Odyssey²* console will conduct a game against itself.

This is a significant step forward. The aracker may choose which role he will assume in any given solitaire contest. And watching the machine handle both sides at once lets the aracker sit back and study a game's strategic nuances.

All three of the cartridges we cover this month — one from Atari and two from Magnavox — are recent arrivals for the aracker in search of solitary recreation.

Blockout/Breakdown (Magnavox AA 9427), the company's first attempt to produce a ball-and-paddle type game, is an ingenious and entertaining variation on a time-tested videogame theme.

In "Blockout," players use blockbusters (balls) to chop through a multi-colored target wall, one block at a time. A horizontally movable paddle, dubbed the power bar, keeps the blockbusters rebounding toward the wall.

The target is not, however, without its defenses. A "demon" inhabits each layer and can magically rebuild demolished blocks.

The player manipulating the power bar has only 90 seconds to clear a pathway to the top of the playfield. By including a time limit and allowing an unlimited number of blockbusters, Magnavox's designers have attempted to compensate for the deficiencies of the joystick as a controller for this type of game. The main drawback is that it takes a lot longer to move the power bar the width of the field with a stick than with the more conventional paddle. On the whole, it's a reasonable compromise.

But it's the pesky demons that give "Blockout" its spice. In order to restore a damaged block, a demon must first make physical contact with one of its power sources, located at the extreme ends of each row. If a block on which a demon is standing gets smashed, the creature tumbles into videogame limbo, reappearing after a brief time penalty.

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even the best up-converters are not quite good enough. So I have kissed my programmability and remote control good-bye. But this radical rejection of technology should not be necessary elsewhere in the country.

In sum, planning of current and future needs is essential. Conveniences—do you want a programmable VCR? a remote control set?—are the second set of choices. Can you live with a less than perfect signal, and thus with black boxes that may degrade picture quality slightly? Do you or will you subscribe to an encoded pay channel? Are you going to tape movies for keeps? (If so, the signal must be as good as the cable company can deliver, and that's your choice.) And finally, how simple do you want to keep your system? These are real issues in hooking up to cable.

The cable industry does not want to face the more exotic problems of videophiles. In talks with people in the industry, I've found the trend is to improve the quality and number of signals and deliver them to consumers through profitable cable company equipment. (Rentals of the converters and speciality hookups are profit-makers for these firms.) TV and VCR manufacturers are concerned about videophiles' problems but unable to act because of differences in cable systems around the country and the relatively low penetration of the service—only 20 percent of American households are cable-wired.

As for "cable-ready" TVs, these only work on some cable channels and do not decode any special pay-TV channels. They cannot solve all cable problems, and their reception of cable channels will not in any way improve your VCR's ability to record off the air. Remember VCRs record from your antenna or cable directly, not through your TV receiver.

Thus, for the foreseeable future, it's up to each subscriber to create his own cable/video system. And perhaps, as the black boxes improve, so will the situation.



Arcade Alley

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In the two-player version, gamers alternate directing the power bar and the demons in successive rounds. But when you're alone, the *Odyssey²* makes a dandy opponent, particularly when it takes charge of the defenders.

In "Breakdown," the point is to obliterate an entire wall in just 60 seconds. It's not quite as difficult as it sounds, since the blockbuster doesn't stop after pulverizing the first block it hits. Instead, it continues to wreak havoc until the player is unable to make it ricochet off the power bar.

"Breakdown" is a great deal faster than "Blockout," and the demons have the extra speed necessary to keep pace with the ac-

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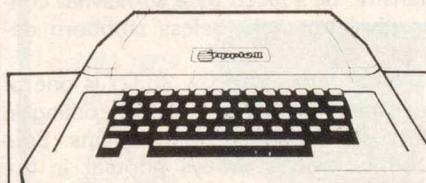


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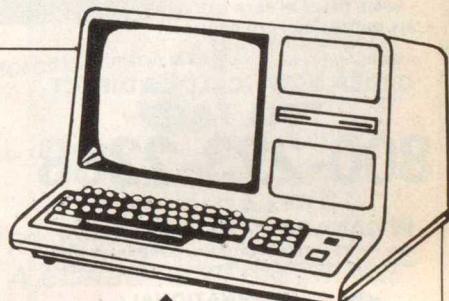
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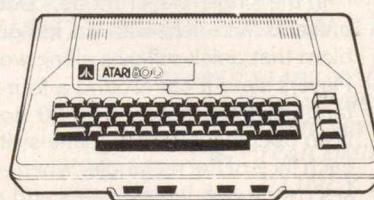
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tion. They zoom along their walls, rebuilding the blocks twice as fast as in "Blockout."

One serious strategic flaw mars this variant: A block containing a demon that is in direct contact with its power source cannot be destroyed. Thus the defender can always avoid defeat.

Electronic Table Soccer (Magnavox AA 9423) brings a long-time commercial arcade favorite to the home screen. In the original mechanical game, each "coach" controls a team that is aligned in columns and fastened to a series of free spinning rods. By a combination of sliding the rods and twisting the handles, it is possible to pass the scaled-down soccer ball from man to man or attempt to kick one into the goal for a score.

The *Odyssey*² electronic version features six on-screen athletes per team: three midfielders, two strikers, and a goalie. Each of the joystick's three horizontal positions — left, right, and center — establishes control over a different column of players. Vertical movement of the stick will cause the appropriate line of players to move from sideline to sideline. Coaches pass and shoot by hitting the action button and pointing the joystick in the desired direction.

Magnavox enhances this video version by simulating the effect of spinning rods. It's not very functional, but it sure is pretty. Teams whirl happily, accompanied by a merry clicking sound, whenever they score a goal.

The solitaire game holds up well. The machine is capable of mounting a crafty attack that may utterly disarm the novice. And when the human coach goes on the offensive, he's faced by a somewhat conservative but nonetheless stubborn defense.

Dodge 'em (Atari CX 2637) is one of those rare videogames that is exciting in either one- or two-player versions. Solo "Dodge 'em" is always popular in the coin-operated fun palaces, and the home arcade version is a solid bet to win similar acclaim.

In the single-player mode, "Dodge 'em" presents arclades with an intriguing problem that quick reflexes alone won't solve. Players steer a car around a four-lane rectangular track covered by 80 dots. There is an opening permitting lane-switching on each face of the rectangle. When a car passes over a dot, it disappears and a point is scored. By periodically changing lanes, drivers can clear the board.

The complication is a second, computer-controlled auto that zips around the track in the opposite direction. The crash car's sole reason for existence is to smash the player's vehicle to smithereens. If the driver doesn't carefully plan lane-to-lane movement, the crash car swerves in such a way as to make a head-on collision inevitable. A crash ends a round, with three rounds constituting a game.

Perceptive arclades will quickly grasp the necessity of treating this as a topological

problem. Developing a pre-planned route that clears the dots with the shortest possible ride will pile up the points. Unfortunately, this strategy will only work twice. After the player sweeps the track clean of dots for the second time, the machine adds another crash car. Avoiding both of them simultaneously takes nerves of steel — and split-second timing in the use of the controller's action button, which can double a car's speed.

The early stages of each "Dodge 'em" game can become predictable as players perfect a "best route" approach. Once the second car appears, though, it transforms the cartridge into a slam-bang battle of wits pitting man against machine. It's a battle most solitaire-minded arcade addicts will want to fight over and over again. **V**

Big Screen TVs

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made of an aluminum foil (with a structural backing) specifically designed for projection television. (Some materials used in the past were originally intended for such items as illustration boards and brochures.) The coating is resistant to chemicals and abrasion, so the screens stand up against fingerprints, moisture, and blistering. They are also easier to wash; most household cleaning detergents can be used.

These screens are also designed to allow the light to blend together to minimize color shift, a color difference in the same image viewed from varying angles. (For example, seen from one spot, an object may look pink; walk to the other side of the screen and it will appear blue.)

Re-engineered rear-projection screens have helped make major performance improvements in this kind of system. Older models had limited light distribution that caused "fall-off," or darkening at the edges of the picture when viewed from an angle more than 20 degrees off the center axis of the screen. New screens increase the viewing angle up to 40 degrees off-axis with no appreciable fall-off. This has been accomplished by combining a new Fresnel field lens—a series of concentric prisms molded into the rear of the screen that distributes light more evenly across the screen—with a lenticular lens element on the front of the screen, which spreads light over a wider viewing angle.

In addition, picture wash-out has been cut down by using a special diffusion compound of acrylic, bulk diffuser, and other materials to scatter the light, retaining contrast and rejecting room light. The diffuser is built right into the surface of the new screens, unlike the painted coating used in earlier systems. And since there is no coating on the hard plastic screens, they can be washed (with liquid soap detergent) without any threat of abrasion.

Improved technology isn't the only reason major companies have entered the

Atari Personal Computer



When Atari—which is clearly the largest manufacturer of videogames, including one called the “Video Computer”—decided to enter the home computer market, the company could have taken the same tack as APF (VIDEO, April 1980),

Bally (November 1979), and Mattel by wrapping a package of computer features around a separate videogame. Instead, the firm brought out two full-fledged computers, the Atari 400 and 800.

To the user, the main difference between computers and videogames is that computers can be programmed by the user, while games depend on programs purchased separately. Thus, computers usually have typewriter keyboards; programming languages such as BASIC; extra memory to hold longer programs; tape or disk drives to save user programs and load prerecorded programs; “character generators” for smoother, denser displays of letters, numbers, and punctuation marks on screen (some videogames just draw crude little pictures of each letter); and provision for “peripheral” add-ons like printers.

The Atari 400 and 800 both have all these features. Both can take almost all of the peripherals, including tape, disk, printer, “modem” for telephone communication with other systems, “light pen” for calling the computer’s attention to specific points on the screen, and joystick and paddle-game controllers. Both can use most of the same programs, too.

But there are also substantial differences: the 400 is available with 8K (roughly 8000 “bytes”) of Random-Access Memory (RAM) for programs or data, at \$500, or with 16K, at \$630. It has a flat, pressure-sensitive keyboard. A slot for program cartridges sits under the flip-up lid just above the keys. The 400 has no display of its own, but can interface with any TV set over Channels 2 or 3. Its output is in color.

The 800 costs \$1080 with a minimum of 16K memory bytes (the 400’s maximum). For the difference in cost, you get increased memory capacity, expandable to 48K, which allows longer, more elaborate programs or lets you process more data. You also get a keyboard with moving keys, two cartridge slots, and an optional video monitor connection.

The two Ataris are “upwardly compatible”—programs and peripherals bought for the 400 can be used with the 800 if the user decides to upgrade or add to that machine later. Some programs and a few peripherals for the 800, though, cannot be used with the smaller model.

Setting up the 400 is simple—just plug its power supply into the wall and into the computer, connect it to the TV antenna connections (using a standard TV/game switch box), and turn the computer and TV on. The screen will display a colored rectangle within a darker border, and the



words “ATARI COMPUTER—MEMO PAD.” In this mode, the 400 is a TV typewriter, displaying whatever you type into it on the screen.

Though only upper-case (capital) letters appear at first, you can get lower-case letters by pushing the “CAPS/LWR” key on the right-hand side of the keyboard. As soon as you get to the bottom of the screen, the display begins to scroll upward, moving the top line off the display each time you add a new line at the bottom.

The “keys” are printed legends on a flat plastic sheet, each surrounded by a raised rim to guide your fingers. They don’t move perceptibly when pressed. They must be struck with moderately high pressure—more than an electric typewriter would need, but less than some manual ones require. The keyboard beeps when keystrokes register, a handy substitute for tactile feedback from typewriter keys.

There are some interesting extra keys: In addition to the ESC and CTR keys used to actuate some computer functions, there’s a tab key, and a key (marked with the Atari logo) that reverses the video display from light letters on a dark background to the other way around. The keyboard has “one-key rollover”—that is, if you type things in faster than the machine can handle them, the first premature keystroke will be saved until the computer can get to it. The display has automatic wraparound, too: if you type past the end of the line, the text automatically continues on the next line.

Depending on what software you buy with the Atari, you can transform it within seconds from a TV typewriter to a computer or a videogame. To do so, lift the lid above the keyboard and insert the appropriate cartridge into a slot. Though it’s the only slot provided on this model, it’s marked “left cartridge” to match the markings of the cartridges themselves, which are keyed to the two-slot 800 model. The slots are also designed so that you can’t insert a cartridge backwards.

The cartridges contain programs in Read-

Only Memory (ROM); and since ROM can be damaged if plugged into a powered-up machine, a safety switch turns the computer off whenever the lid is open. Close the lid and the computer goes on, with a new legend on the screen to indicate which program is loaded.

The computer comes with one cartridge, containing BASIC. As soon as that’s plugged in, you can begin programming. Most cartridges, though, demand other facilities (plainly listed on each one’s box). Game cartridges, for example, usually require at least one joystick or paddle controller (jacks are provided for four). Cassette games require Atari’s special cassette recorder. The Education System Master Cartridge requires the cassette recorder and any of the four-cassette Talk and Teach courses.

Either cassette, disk, or both are strongly recommended for use with the BASIC cartridge, Pilot programming language cartridges, or the 6502 assembler cartridge (for programming in machine language). Either saves programs for easy reloading; without them you must type in an entire program each time you want to run it. And unless you’re perfect typist, you’ll also have to find and correct typos that interfere with the program.

Performance. We tried the 400 in three of its modes: as a game, as a computer, and as an educational device.

As a game, we loved it. We tried basketball, Space Invaders, chess, and a Video Easel program (which isn’t exactly a game). The graphics were highly detailed, though we’ve seen slightly finer detail in games we haven’t tested, including Atari’s own Video Computer. The basketball court was in full perspective, with legs pumping and hands moving as players dribbled or shot the ball, accompanied by reasonably realistic sound effects from the TV set’s speaker. The chessmen were easy to identify. The Space Invaders graphics were less interesting than their basketball counterparts, perhaps because they de-

picted only imaginary objects—at least six different kinds of alien, a big green rocket ship, a small command ship, and a cannon with which we vainly attempted to defend our Earth. But that didn't spoil the fun in the least, especially with the explosive sound effects coming from our TV set.

The cassette recorder is a special model with fixed input and output gain, so you needn't fiddle trying to find the right volume level to make cassettes load properly. The machine also has a special multi-pin connector which fits into a jack on the side of the computer; you can't use another tape deck. The computer turns the cassette motor on and off in playback and recording, as do most home computer systems, but leaves you in full control of rewind and fast-forward, a nice touch some other systems omit. The recorder costs \$90 and has a three-digit index counter.

The joystick controllers, apparently the same ones used by Atari's videogames, seemed ruggedly constructed, but were a bit hard to push. The top of each was marked but could have been marked more conspicuously. We didn't have any trouble, but some of the kids who played did. The shape is a bit awkward for hand-holding and its base doesn't have enough area or traction for easy table-top use. We did like the nice, fat control stick handles, though. The joysticks are priced at \$20 per pair. OPTION and SELECT buttons at the side of the keyboard let you choose the level of game difficulty and, except in chess, the number of players.

Since the computer beat us handily at chess in Level 1 (in which it takes 30 seconds for each move), we didn't try the more difficult levels, which range up to Level 7 (10 hours per move!). Perhaps we should have tried introductory Level 8. The computer has 15 seconds per move, but you can take as long as you need for your moves. And the program follows all the rules, including pawn promotion, castling, and taking *en passant*.

The Video Easel program isn't a game, though it contains one (the graphic game of "Life," in which patterns grow and change according to mathematical rules). The program can also be used to draw lines on screen, using the joysticks to guide the "pen," or to generate graphic patterns. The results were pretty and fun.

Operation in BASIC impressed us. Atari BASIC is a versatile dialect of the language with all the basics we could think of, including rudimentary line editing, full string manipulations, a full range of arithmetic and trigonometric functions, and the ability to tie in machine-language programs and routines as well as a number of interesting extensions.

As you'd expect from Atari, the language includes lots of graphics, sound effects, and interfaces for paddle and joystick controllers. There are nine graphics modes, including several that allow both graphics and text on screen simultaneously. The pure graphics modes allow four colors with up to 160 horizontal by 96 vertical picture details, or two colors with 320 by 192 details. The screen can also be split into two columns. The graphics modes are numbered, not lettered, so one can easily have the program change modes in response to arithmetic or logical operations. Colors can be selected by program, too. Programs can draw lines between specified points, place the cursor where desired, and display a range of graphics characters which includes arrows, the four-card suits, and a variety of abstract shapes. Sounds generated can be modified in pitch, volume, voice, and distortion (used to enrich an otherwise pure tone).

Atari BASIC has a number of other unexpected and useful features. Perhaps the most useful is its

BERGER-BRAITHWAITE VideoTests

ability to chain programs together, so programs too long to fit in memory in one piece can be saved and loaded as separate modules, with only the module in use being in memory at any moment. That's especially useful with the 400, which can be purchased with as little as 4K of memory, and whose maximum is 16K. But it's a nice safety feature even if you have an 800 with a full 48K of memory.

Another useful feature is an error-trapping command (TRAP), comparable to but terser than the ON ERROR GO TO . . . command in some other BASICs. TRAP directs the program to a specified line number when it detects an error. There's also a BYE command which switches the computer from BASIC into memopad mode without losing the BASIC program and its data.

Routines for interfacing between BASIC and machine language are well-thought-out. There are PEEK and POKE commands to check memory contents and to put data or commands into memory, a USR function to call machine-language routines, and an ADR function to tell your program where to find specific strings in memory. There's no DEF function for BASIC user programs, though. One of the manuals includes a listing for a BASIC program allowing you to input hexadecimal data or commands directly into memory.

The 400 comes with two manuals: an introductory book for programmers not already familiar with BASIC, and a guide to details of Atari BASIC for those who are familiar with it or who have become so by reading the other book. The latter manual has such nice touches as a list of error codes inside the front cover (with fuller explanations in an appendix) and a list of graphics codes inside the back cover. In each case, material you'll often need is where it's easiest to find. The table of contents is exceptionally detailed, and there's also a long index.

Since Atari can't predict how badly a TV set used with the computer will overscan—that is, how much of the picture will fall outside the screen—it allows you to adjust the number of letters per screen line, from 36 to 40, so that you'll be able to read everything in your program on any set.

About the only thing we didn't much like about Atari BASIC is its editing procedure. To edit a program line after it's been written and entered, you must first list the line or the program, then use the cursor-control arrows to position the cursor over the point where you want the editing to take place. That's not as convenient as the list of editing commands available in some Microsoft-written BASICs, such as Radio Shack Level II or Level III, but it's still more convenient than a BASIC system (such as Radio Shack Level I) in which the only means of editing is to rewrite a line from scratch.

We tried a few of the educational programs, with mixed results. The fundamental idea is rather clever: a narrator speaks while the screen shows an abridged version of his words, plus occasional sketches—the kind of graphics one does on a typewriter—to liven up the display. Here and there the tape stops and the user gets a multiple-choice question, to be answered by pressing a key on the computer. If the answer is incorrect, the computer buzzes disapprovingly. Only when the correct answer is given will the

program continue, with the narrator reinforcing the student by saying "good" or "right."

This is a primitive form of "programmed learning," designed to let a student learn at his own pace. When a student gets the right answer, the system works fine. When he gets a wrong one, though, a less primitive system would guide him back to the portion of the text he misinterpreted, or even to a special text section designed to show him the reason for his error. Unfortunately, that isn't possible with a system based on tape cassettes. But with a floppy-disk system, the program could move around within the disk's contents, going backwards, forwards, or branching sideways into special routines for handling student errors. The Atari system is only smart enough to teach a 10-year-old, and not the brightest 10-year-old at that. Yet much of its subject matter is high-school-level.

We object to the Great Classics program, in which the narrator briefly summarizes major books (*David Copperfield*, *Moby Dick*, etc.), stopping here and there to quiz the student. The result is strictly an exercise in comprehension, with only a tenuous relationship to its ostensible subject. In a history course, for example—and the history program we tried is reasonably good if shallow, on a six-grade level—a smattering of facts is of some limited use because facts are of predominant importance. But in subjects like literature, where experience and its interpretation are paramount, a recital of plot summaries teaches only plot, unadorned by character or style. This makes great literature seem dull, and may leave students with the illusion that they've actually read and familiarized themselves with works they've never read.

Expandability. This isn't usually one of our categories, but with computers it's a vital one. If you're serious about computing—and it's easy to become so, once you've gotten into it—you'll want to keep expanding your system to encompass all your applications.

At first glance, the 400 meets that test. You can add a printer to it, either to list programs or to print messages. And you can add an Interface Module (\$620) to accommodate a floppy-disk system, a modem for telephone communications, as well as printers, terminals, and other devices using serial or parallel port connections.

We tried the Model 822 printer (\$450). It's a 40-column thermal type, which means it can print up to 40 characters per line, and that it uses "thermal" paper, which darkens where touched by the heated rods of the print head. Thermal printers are very quiet but require special paper. And since the print head doesn't touch the paper, you can't make carbons and have to print things out one copy at a time.

The printer uses only a 5x7 dot matrix, which means each letter is five dots wide by seven dots high. That's enough to do upper- and lower-case letters and point graphics (pictures plotted or drawn on the printer), but the results, especially on lower case letters, are a bit crude compared to some other printers we've seen. The print head moves bi-directionally: as it's printing one line from left to right, it's storing the next in an interval memory, so it can then print it out from right to left without wasting time on a carriage return. It comes with a special plug that fits only Atari computers, as far as we know; it may be used with or without the Interface Module.

Also available is the Atari 825 printer (\$1000), which is considerably more versatile. It can print up to 80 characters per line in its normal spacing, with a more detailed 7x8 dot matrix, but can also print condensed characters (up to 134 characters), or up to 40 double-width characters per line. And it can be set to do proportional